From:	HOPE Bruce
To:	Dana Davoli/R10/USEPA/US@EPA; Burt Shephard/R10/USEPA/US@EPA
Cc:	Chip Humphrey/R10/USEPA/US@EPA; Chris Thompson; Eric Blischke/R10/USEPA/US@EPA; Jeremy Buck; Joe Goulet/R10/USEPA/US@EPA; PETERSON Jenn L; Bob Gensemer; Robert.Neely@noaa.gov
Subject:	RE: Portland Harbor Food Web Model comments
Date:	03/06/2006 12:58 PM

Hi All,

Right now, we have the physical-chemical parameters to do transport & fate modeling for the following organic chemicals:

Naphthalene
Phenanthrene
Fluoranthene
benz(a)anthracene
benz(b)fluoranthene
dibenz(a,h)anthracene
benzo(ghi)perylene
PCB 18
PCB 66
BCB 118
PCB 153
PCB 194
DDT
DDE
DDD

PCB 126, from a transport & fate perspective, falls within the range represented by PCB 118. From a food web model perpective, the PAHs are the only ones that might prove challenging - although I have seen a paper or 2 on PAH metabolism in fish that might serve as a starting point or provide a range estimate. For both transport & fate and food web, metals & organometallics are another matter - one that you might consider handling only if its a more significant issue than the organics.

Bruce

-----Original Message-----
From: Davoli.Dana@epamail.epa.gov [mailto:Davoli.Dana@epamail.epa.gov]
Sent: Monday, March 06, 2006 10:54 AM
To: Shephard.Burt@epamail.epa.gov
Cc: Humphrey.Chip@epamail.epa.gov; Chris Thompson; Blischke.Eric@epamail.epa.gov; HOPE Bruce; Jeremy Buck; Goulet.Joe@epamail.epa.gov; PETERSON Jenn L; Bob Gensemer; Robert.Neely@noaa.gov
Subject: RE: Portland Harbor Food Web Model comments

As we have not made a formal decision as to which chemicals we will be modeling, I tried to modify the language to give us a little wiggle room. Other things may pop up at Arkema and Rhone Poulenc and we have never discussed how important dioxins and furans are.

Burt Shephard/R10/USEPA/US 03/06/2006 10:22 AM	To	Dana Davoli/R10/USEPA/US@EPA
	cc	Chip Humphrey/R10/USEPA/US@EPA, Chris Thompson <chris.thompson@eiltd.net>, Eric Blischke/R10/USEPA/US@EPA, Bruce Hope <HOPE.Bruce@deq.state.or.us>, Jeremy Buck <jeremy_buck@fws.gov>, Joe Goulet/R10/USEPA/US@EPA, Jennifer Peterson <Peterson.Jenn@deq.state.or.us>, Bob Gensemer <rgensemer@parametrix.com>, Robert.Neely@noaa.gov
	Subject	RE: Portland Harbor Food Web Model comments(Document link: Dana Davoli)

Dana,

I'd be fine with adding in a recommendation to model selected toxicologically important congeners such as PCB 77, 126 and/or 169, I should have thought of that when I wrote my comment. They're important

for both human health and wildlife risk assessments. What I wouldn't recommend is a request to LWG that has them modeling 20 or so individual PCB congeners. They will have enough to model without running that many different PCB congeners.

I really didn't discuss other chemicals other than PCB congeners. I assume LWG will continue to model DDT, they'll also likely eventually add DDD and DDE, although the latter two could be addressed in a DDT model if metabolic transformation rates of the parent DDT can be identified in the literature for the species of interest. I have mixed feelings about modeling PAHs. You'll definitely need metabolic transformation rate information for PAHs, particularly if you're modeling into fish, otherwise you'll end up with the T4 modeling fiasco all over again (i.e. predicted PAH concentrations in the hundreds of mg/kg in fish tissue).

As is the case with PCBs, its difficult to model total PAHs. If PAH modeling is to be performed, I'd recommend limiting it to a few specific compounds, such as pyrene, fluroanthene or benzo(a)pyrene. I'd have to look at the sediment data to see which of the higher molecular weight PAHs are the most abundant in Portland Harbor sediments before making a detailed recommendation as to which PAHs to model.

I haven't heard anyone bring up modeling of mercury, except possibly in the context of sturgeon. The Arnot and Gobas model is not appropriate for modeling mercury. Bruce Hope's published mercury model for the Willamette River from a few years ago would be the obvious choice is there is a need to model Hg.

Best regards,

Burt Shephard
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Dana Davoli/R10/USEPA/US
03/06/2006 09:32 AM

To: Chip Humphrey/R10/USEPA/US@EPA
cc: Chris Thompson <chris.thompson@eiltd.net>, Eric Blischke/R10/USEPA/US@EPA, Bruce Hope <HOPE.Bruce@deq.state.or.us>, Burt Shephard/R10/USEPA/US@EPA, Jeremy Buck <jeremy_buck@fws.gov>, Joe Goulet/R10/USEPA/US@EPA, Jennifer Peterson <Peterson.Jenn@deq.state.or.us>, Bob Gensemer <rgensemer@parametrix.com>, Robert.Neely@noaa.gov
Subject: RE: Portland Harbor Food Web Model comments(Document link: Burt Shephard)

Chip, after reading Eric's comments and Burt's additional comments, I only had a few additional suggestions.

(1) On page 5, under "Contaminants" for Polychlorinated Biphenyls.- I am not convinced that it is appropriate for us to recommend to the LWG that they model PCB congener homolog groups or abundant PCB congeners (as suggested by Burt and ODEQ) rather than a congener with high toxicity (e.g. PCB 126). We asked for analysis of congeners in sediment and biota using methods that would be able to detect PCB 126. Part of the rationale for this (I thought) was to be able to show that the use of total PCBs (Aroclors?) as a remedial clean-up goal would be protective of toxicity from the dioxin-like PCB congeners, of which PCB 126 is the most toxic for human health and is usually the risk driver. Therefore, I recommend that we modify the sentence to read, "Because PCB congener 126 is the most toxic of the PCB congeners and would likely drive the sediment clean-up for PCBs for human health, the FWM should include modeling of PCB 126. This will be necessary to show that development of a remedial goal based upon total PCBs, rather than dioxin -like PCB congeners, would be protective.

If I am off base here just let me know!

(2) On the first page under General Comments, under "Identify Chemical to Be Modeled....", I recommend that the last two sentences be modified to, "Key questions include how to address chemical mixtures, whether to model PAHs, whether how to model PCB congeners and which congeners to model, and what other pesticides chemicals to model. Preliminary screening of contaminants detected in fish tissue (e.g., as presented in the PRE and/or the results of the human health screening), as well as other data, may facilitate the selection of chemicals to be modeled.

Burt Shephard/R10/USEPA/US
03/03/2006 04:32 PM

To: Eric Blischke/R10/USEPA/US@EPA
cc: Chip Humphrey/R10/USEPA/US@EPA, Dana Davoli/R10/USEPA/US@EPA, Bruce Hope <HOPE.Bruce@deq.state.or.us>, Joe Goulet/R10/USEPA/US@EPA, Jennifer Peterson <Peterson.Jenn@deq.state.or.us>, Bob Gensemer <rgensemer@parametrix.com>, <Robert.Neely@noaa.gov>, Jeremy Buck <jeremy_buck@fws.gov>, Chris Thompson <chris.thompson@eiltd.net>
Subject: RE: Portland Harbor Food Web Model comments(Document link: Dana Davoli)

Eric,

Sorry that I haven't been able to provide detailed FWM comments to this point. I'm buried on litigation time-sensitive deadlines for both the Oregon water quality criteria biological evaluation and the Upper Columbia River site negotiations with Teck Cominco. But I believe there should be one overriding general comment on the LWG's draft food web modeling report that has not been captured, or at least captured strongly enough, in any of the comments. General comment 1 of our comment letter should be along the lines of the following;

"On May 31, 2005, EPA provided to the LWG a list of five food web modeling objectives, as well as nine food web modeling specifications EPA and its partners believes the Portland Harbor food web model must fulfill in order for the model to meet the defined modeling objectives. These modeling objectives and specifications were reiterated to LWG on July 29, 2005. Based on the presentation of LWG's model objectives and specifications in it's November 4, 2005 Draft Food Web Modeling Report, EPA has identified a lack of concordance between the LWG's modeling objectives and specifications and the objectives and specifications as defined by EPA. Although there are several areas where differences on model objectives and specifications between EPA and LWG could be highlighted, perhaps the largest is EPA's Objective 4: ability to incorporate temporal variability. Steady state models such as Arnot and Gobas in the form used by LWG simply cannot explicitly incorporate temporal variation into the model. This means the LWG's modeling efforts will not be able to predict the length of time post-remediation needed for fish tissue concentrations to reach acceptable risk levels. Until the differences between EPA and LWG on the overall modeling objectives and specifications are reconciled, EPA believes it is premature to provide extensive specific comments on the results and conclusions of the draft report, as it is uncertain whether all of EPA's model objectives and specifications can be attained by LWG's modeling approach. EPA is providing comments on those aspects of LWG's modeling approach where a steady state model can meet our modeling objectives and specifications. However, there needs to be agreement between EPA and LWG on modeling objectives and specifications before additional modeling takes place, so that LWG's modeling efforts can continue to advance the RI/FS process."

The EPA FWM objectives and specifications sent to LWG last summer were reviewed by several expert food web modelers, including Larry Burkhard and Todd Bridges, before they were forwarded to LWG. The reviewers all felt that our objectives and specifications were appropriate and reasonable for Portland Harbor. Unless we as a group have decided to change one or more objectives and/or specifications, we should insist that LWG meet ALL EPA objectives and specifications, not just the ones they choose to meet.

I have several other comments, some of a general nature, some of a specific nature, as follows:

- For modeling objectives and specifications that can be performed with a steady state model of organic compounds, the Arnot and Gobas model is acceptable for use at Portland Harbor.
- It is discouraging that the model performance, in general, did not

improve over that described in the LWG's initial FWM report. LWG does not appear to have accepted EPA's suggestions on the first modeling effort in many instances. One example where this is clear is in the modeling results for black crappie, where EPA suggested that a more zooplankton rich diet be defined for crappie, which have gill rakers specifically designed to capture zooplankton and larval fish from water. One possible cause of the continuing overprediction of contaminant levels in crappie observed in this report is a diet too rich in fish.

The LWG concern about poor model predictions at smaller spatial scales for fish species with larger home ranges can be addressed by only modeling small home range species during model runs of spatial scales smaller than the entire ISA. It is biologically unrealistic to try and force fish with large home and/or foraging ranges into a spatial area smaller than their home range for modeling purposes. Limit modeling of spatially small areas to fish species such as sculpin with small home ranges.

Model calibration suggestion: A reading of the dissertations of several of Frank Gobas' graduate students shows that one of the methods they use to improve the agreement between modeled and field collected tissue residues is to change the log Kow value of the chemicals being modeled. Given the range of measured log Kow values for chemicals in compendia of physical and chemical parameters such as Mackay's 5 volume Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals, and the known sensitivity of Gobas type model to changes in log Kow (amply demonstrated in the LWG report), it seems reasonable to adjust the log Kow value in the model so that the measured and model predicted tissue residues are comparable to each other. This is particularly true if we (EPA and LWG) are satisfied with the values of other model parameters, particularly parameters for which the model is moderately sensitive, such as dietary preferences. A change of 0.3 log units in a log Kow value could give as much as a 2x increase or decrease in predicted tissue residues. As long as the selected log Kow value is reasonable (e.g. I wouldn't want to see a log Kow for DDT of 1.7), this is one method the predictive ability of the model could be rapidly improved.

Chemicals to be modeled: Although it is likely any PCB cleanup levels ultimately defined for Portland Harbor will be based on total PCB concentrations, we all recognize the difficulties and uncertainties associated with modeling total PCB. One suggestion for improving the accuracy of PCB modeling would be to model either homolog groups (e.g. hexachlorobiphenyls) or selected individual congeners that are either indicators (among the most abundant individual congeners on a weight percent basis) for specific Aroclor mixtures, or which are among the most abundant congeners in higher trophic level fish species (e.g. PCB 138, PCB 153 and PCB 180).

Give a call if you have questions, I'd be happy for a break of a few minutes from Oregon Toxics or the UCR site.

Best regards,

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